

Remarks

Rejections Under 35 U.S.C. 102(b)

Claim 11 stands rejected as being anticipated by Carroll. At paragraph 1 of the Office Action dated May 19, 2003, the Examiner states that Carroll teaches: “a pin (55) having an end portion (53) with a first pressure surface matingly received by the first end of the passage, substantially blocking the passage at the retracted position.” The Examiner further concludes: “The second part of the end is the second pressure surface that comes into contact with the fluid from the fluid supply[.]”

The Examiner would interpret claim 11 to include a design wherein multiple pressure surfaces might be found on one end of a pin. To the contrary, Applicant is claiming first and second pressure surfaces on first and second ends of the pin. Claim 11 recites the following limitations:

a first end of said pin having an end portion with a first pressure surface...

a second end of said pin includes a second pressure surface...

Moreover, it is plain from Applicant's drawing figures and specification that the invention is such that dual actuating means (e.g. “pressure surfaces”) are at opposite ends of the pin. This is distinct from the design proposed by the Examiner wherein the actuating means are at the same end of the pin. Carroll does not teach first and second pressure surfaces on first and second ends of a pin, and the rejection is therefore overcome.

In addition to the distinction above, claim 11 requires three alternative, exclusive means by which the pin may be actuated. Applicant has amended claim 11 to better emphasize the capability of reciprocating the pin by three different methods. Amended claim 11 recites:

said pin can be extended or retracted by: adjusting fluid pressure at said first pressure surface only, adjusting fluid pressure at said second pressure surface only, or adjusting fluid pressure at both of said first and said second pressure surfaces.

Carroll does not teach an apparatus wherein the pin is reciprocated by adjusting fluid pressure at separate pressure surfaces. Under the Examiner's reading of Carroll, wherein

two pressure surfaces are defined at one end of the pin, one would be unable to adjust fluid pressure at both surfaces independently as required by claim 11. Accordingly, Carroll does not provide the advantages in operating flexibility offered by Applicant's claimed design. Applicant's design can provide high pressure fluid to the mold at the instant that rod 22 is extended. Similarly, the rod can be held in an extended position to evacuate fluid from the mold. Carroll therefore does not teach all the limitations of the claimed invention, and the withdrawal of the rejection thereto is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 3 and 5 stand rejected under §103 as unpatentable over Carroll in view of Daniels. The Examiner states that it would have been obvious to one of ordinary skill to modify Carroll with an actuator as taught by Daniels "because it allows for an improved seal of the passageway with the controlled movement of the pins." Applicant has amended claim 1 to recite: "wherein said pin is urged from its retracted position to its extended position when said pressure surface is exposed to pressurized fluid via said hollow passage." Further, claim 1 requires an actuator that can function independently of the fluid pressure on the distal portion, thereby controlling injection of fluid into the mold: "said pin being reciprocable between its extended position and retracted position with said actuator." Applicant contends that there would be no motivation to one of skill in the art to combine the teachings of Carroll and Daniels to obtain the invention of claim 1, and the rejection is overcome.

In the invention of claim 1, the pin can be extended to initiate fluid injection by supplying pressurized fluid to the distal portion of the pin. The pin can also be moved between its extended and retracted positions with the separate actuator. The Examiner has cited no art that teaches or suggests a design having the claimed dual means for controlling movement of the pin. The Examiner argues that the invention of claim 1 would be obvious in view of the teachings of Carroll and Daniels, because of the suggestion for "an improved seal of the passageway with the controlled movement of the pins." It is not clear what "improved" sealing is, but if anything, one of skill in the art viewing the Carroll and Daniels references would consider an alteration of Carroll with the incorporation of a pneumatic actuator according to Daniels to detract from efficient

sealing and/or reciprocation of the gas injection valve. Further, Daniels actually teaches away from the proposed combination. Daniels requires that the cylinder be moved a distance “d” before gas delivery can begin (See Figure 8). To halt gas delivery in the Daniels system, the gas supply pressure is reduced. Thus, to enhance sealing of the valve in Daniels, the fluid flow would be reversed on the pneumatic cylinder, however, because the pneumatic actuator and gas delivery to the mold are interconnected, such closing of the valve would also evacuate fluid from the mold. As such, there is no technical basis for concluding that Daniels would “improve” the valving of the Carroll design, and there would be no suggestion to one of ordinary skill in the art to make the proposed modification.

Moreover, independently actuating the fluid injection pin with either fluid or an actuator offers operating advantages absent from both of Carroll and Daniels, and not suggested by their teachings. For instance, the actuator can be operated to hold rod 22 in a retracted position while fluid pressure is allowed to build in the supply line prior to injection. When initiation of injection is desired, the actuator can be operated to extend rod 22 in cooperation with fluid acting on the enlarged distal portion, allowing fluid injection to begin. Applicant’s design can provide high pressure fluid to the mold at the instant that rod 22 is extended. This advantage is simply not offered by an apparatus according to either of Daniels or Carroll, and is not obvious in view of the teachings of either reference. The proposed combination of Daniels and Carroll does not teach or suggest all the limitations of the present invention, nor does the combination present the advantages in efficiency and flexibility in operation associated with Applicant’s invention of claim 1. The rejection of claim 1 is therefore overcome, and withdrawal of the same is respectfully requested. The rejections of claims 3 and 5, both of which depend from claim 1, are overcome for reasons similar to the reasons expressed with respect to claim 1, and withdrawal of the rejections thereto is also respectfully requested.

Claim 4 stands rejected under §103 as unpatentable over Carroll in view of Daniels, as applied to claims 1, 3, and 5, and further in view of Denne. Claim 4 depends from claim 1, and the rejection thereto is overcome for reasons similar to those expressed with respect to claim 1.

Claim 6 stands rejected under §103 as unpatentable over Carroll in view of Daniels as applied to claims 1, 3, and 5, and further in view of Terao. Claim 6 depends from claim 1, and the rejection thereto is overcome for reasons similar to those expressed with respect to claim 1.

Claims 7-10 stand rejected under §103 as being unpatentable over Carroll in view of Daniels et al and Denne. Applicant has amended claim 7 to recite: “said pin being urged from said retracted position when pressurized gas is supplied to said enlarged distal portion.” Further, Applicant has amended the last two lines of claim 7 to recite: “said pin being reciprocable independently of said gas with said actuator.” This combination of dual actuating means is similar to that described with respect to claim 1. The Examiner has not cited a single reference or combination of references that discloses or suggests all the limitations of claim 7. In particular, none of the cited references discloses or suggests the use of an electronic actuator that can be independently operated to extend or retract the pin in an apparatus that can supply a gas pressure to an end of the pin to extend it. In Applicant’s specification, at original page number 4, lines 7-8, it is stated that the embodiment “will allow for various amounts of gas to be released depending on the size of the outlet opening created at the nozzle end by actuated movement of the rod in the chamber.” For example, the rod can be extended or retracted while gas is supplied at a constant pressure, i.e. controlling the rod independently of the gas pressure.

The Examiner argues that “it would have been obvious to one of ordinary skill in the art to modify Carroll with an actuator as taught by Daniels because it allows for an improved seal of the passageway with the controlled movement of the pins.” Further, the Examiner asserts that the substitution of an electronic actuator as taught by Denne for the pneumatic actuator of Daniels would be obvious in light of better “control and precision.” Similar to the foregoing discussion with regard to claim 1, the proposed modification would not provide “improved sealing of the passageway,” nor would it provide the distinct, unobvious advantages in operating flexibility offered by Applicant’s claimed invention. Daniels describes separate embodiments (Abstract): a first design extends the rod with gas pressure at the end of the rod; a second design extends the rod with gas supplied to the cylinder. The Daniels actuator is not operable independently of the gas pressure supplied to the end of the rod, as required by claim 7. The actuator is actually

part of the gas delivery system. Daniels discloses only a system wherein operation of the pneumatic actuator is tied to the gas supply pressure, and Daniels therefore teaches away from applications wherein an actuator (any actuator, if one is to be substituted for the disclosed pneumatic actuator) is operated independently of the gas supply.

The Examiner's proposal would require one of skill in the art to first conclude that the Daniels actuator would improve sealing of the Carroll passageway. It is not clear what "improved" sealing is, but if anything one of skill in the art viewing the Carroll and Daniels references would view an alteration of Carroll with the incorporation of a pneumatic actuator into the gas delivery system to detract from efficient sealing and or closing of the gas injection valve. Similar to the discussion with regard to claim 1, there would thus be no suggestion to combine the teachings of the references in the first place, and Daniels teaches away. In spite of these problems, the Examiner's proposal further requires one of skill in the art to conclude that the obvious solution would be substitution of a different type of actuator, namely, the electrical actuator of Denne.

Even if the cited references properly taught all the limitations of claim 7, which they do not, the proposed combination is made with the benefit of hindsight. To arrive at the invention of claim 7, the Examiner would require one of ordinary skill to decide to incorporate the actuator of Daniels with the Carroll system, then second-guess the selection of a pneumatic actuation and conclude that a *better* actuator could be found in Denne, then construct an apparatus with dual actuation means such as Applicant's invention of claim 7. The Examiner has not set forth any suggestion in the art, consistent with the teachings of the references that would lead one of ordinary skill to make the myriad modifications necessary to arrive at Applicant's claimed invention. Applicant contends that the backward-looking steps based with the benefit of Applicant's disclosure are the antithesis of obviousness. Without the requisite teachings in the art, the proposed combination of references does not set forth a prima facie case of obviousness, and the rejection is overcome.

The present amendments emphasize the use of two independent actuating means to operate the pin. Applicant has explained this feature of the claimed invention in responses to prior Office Actions, and the subject matter of the amendments (the means for actuating the pin) has therefore previously been considered by the Examiner. Because

the present amendments are believed to emphasize the use of both fluid and a separate actuator to reciprocate the pin, they are believed to distinguish over all of the cited references and place the claims in condition for allowance. Entry of the amendments, and consideration of the arguments set forth herein is therefore respectfully requested.

WHEREFORE, all the claims of the instant application are believed to be in condition for allowance, which is respectfully solicited. If the Applicant may be of any further assistance in the prosecution of this application in any way, the Examiner is invited to contact the undersigned at (248) 364-2100.

Respectfully submitted,

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I hereby certify that this paper (along with any paper referred to as being attached or deposited) is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 19, 2003

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